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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,910	03/19/2004	Seiichi Higaki	ASAM.0115	6368
7590	09/08/2005		<div>EXAMINER</div> <div>PATEL, KAUSHIKKUMAR M</div>	
REED SMITH LLP Suite 1400 3110 Fairview Falls Church, VA 22042			<div>ART UNIT</div> <div>2188</div>	<div>PAPER NUMBER</div>
			DATE MAILED: 09/08/2005	

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

10/803,910

Applicant(s)

HIGAKI ET AL.

Examiner

Kaushikkumar Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2004 and 27 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-15 and 18-20 is/are rejected.
- 7) ☒ Claim(s) 6-7 and 16-17 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/19/04 4/27/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on March 19, 2004 and April 27, 2005 have been considered by examiner. It is noted that Japanese documents 2000-293314 and 06-004979 have been considered to the extent made possible by English language abstract.

Drawings

3. The examiner has approved the drawings filed on March 19, 2004.

Specification

4. The specification is objected to because of following informalities.

On page 1, lines 17-19, "In such applications...reliability." should be "In such applications severe requirements are thus imposed with regards to high performance and high reliability".

On page 2, line 18, "host bass" should be "host bus".

On pages 2-6, "first logical volume and second logical volume" should be appropriately changed to "host logical volume for control/data and internal logical volume".

5. A substitute specification in proper idiomatic English and in compliance with 37 CFR 1.52(a) and (b) is required. The substitute specification must be filed accompanied by a statement that it contains no new matter.

6. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "A storage control device for longevity of the disk spindles based on access of Hard Disk Drives".

Claim Objections

7. Claims 1-20 are objected to because of the following informalities:

Claim 1, lines 2-4, 11-12 and 24, "first logical volume" should be appropriately changed to "host logical volume for control and or data".

Claim 1, lines 12, 18 and 24, "second logical volume" should be appropriately changed to "internal logical volume".

Claim 1, lines 20-21, and 25, "logical volume" should be appropriately changed to "at least one host logical volume for control".

Similarly for claims 2-20 the terms "first logical volume and second logical volume" should be appropriately changed to "host logical volume for control/data and internal logical volume" as teachings from the specification and the drawings.

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Claim 1, line 13, "a storing region in" should be "a storing region for".

Claim 1, line 18, "the data to the second" should be "the data of the second".

Claim 1, line 23, "which causes other second logical volume" should be "which causes another internal volume".

Claim 1, lines 26-27, "disk drives-----relation is written" should be "disk drives on which the another internal logical volume is mapped".

Claim 2, lines 3-4, "which data-----relation is written" should be "which the internal logical volume is mapped in response to the change-over indication".

Claim 3, lines 3-5, "onto which-----relation is written," should be "onto which disk drives the another internal logical volume is mapped,"

Claim 3, lines 8-9, "disk drives on which-----relation is written" should be "disk drives on which the another internal logical volume is mapped".

Claims 6-7, lines 1-2, "in the case that kind of command" should be "in the case a command".

Claim 8, line 2, "which causes the other second logical volume" should be "which causes the another internal logical volume".

Claim 9, lines 3-7, "disk drives on which-----relation is written" should be "disk drives on which the internal logical volume to be changed in response to the change-over indication is mapped and which operates the spindle motors of the plurality of the disk drives on which the another internal logical volume is mapped".

Claim 10, line 2, "the command" should be "a command".

Claim 11, line 3, "providing storage " should be "providing a storage".

Claim 11, line 14, "storing region in transmission" should be "storing region for transmission".

Claim 11, line 20, "adapter as data group" should be "adapter as a data group".

Claim 11, line 24, "other second logical" should be "another internal logical".

Claim 11, lines 28-29, "on which disk drives-----relation is written" should be "disk drives on which the another internal logical volume is mapped".

Claim 13, lines 4-6, "disk drives-----relation is written," should be "on which disk drives the another internal logical volume is mapped".

Claim 13, lines 10-11, "disk drives-----relation is written" should be "disk drives on which the another internal logical volume is mapped,"

Claims, 16-17, line 2, "that kind of command" should be "that a command".

Claim 18, line 3, "causes the other second" should be "causes the another internal".

Claim 19, lines 3-5, "disk drives-----relation is written" should be "disk drives on which the internal logical volume is mapped".

Claim 19, lines 7-8, "disk drives-----relation is written" should be "disk drives on which the another internal logical volume is mapped".

Claim 20, line 3, "channel adapter the command" should be "channel adapter that a command".

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

9. Claims 4-5 and 14-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claims 4-5 and 14-15, it is not clear what is being claimed. For example, it is not clear what "one" refers to in line 1 of each of the claims 4-5 and line 2 of the claims 14-15.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1,11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pesola et al. (US 2003/0126327 A1) and in view of Kedem (US 6,725,331 A1).

12. For claims 1 and 11, Pesola and Kedem both teach a storage control device (Fig. Of Pesola 2A and Fig. 1 of Kedem)

A channel adapter which is connected to an upper device, and provides a host (first) logical volume to the upper device and receives data which are sent from the upper device to the host logical volume. (Pesola teaches a volume translation apparatus (220) figure 2A, which is separate device from the host machine and data storage library and can be integrated into a controller or as a hardware or software or any

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combination of hardware and software, see paragraphs [0045] and [0046] also it provides the intermediate layer which is identified as virtual volume (host logical volume) see paragraph [0043], lines 1-5).

A memory, which is connected to the channel adapter and stores the data exchanged between the upper device and the memory, control information with respect to the data exchanged between the upper device and the memory, and configuration information with respect to the configuration of the storage control device. (Kedem teaches a volume mapping apparatus (figure 1, item 1) with globally accessible memory (figure 1, item 100) with volume mapping and configuration information and performs the volume mapping functions (column 2, lines 60-64) and stores data transfer between the host and disk drives (column 2, lines 37-40)

A disk adapter which controls reading and writing the data, which are sent from the upper device to the host logical volume from on to the memory as being sent to an internal (second) logical volume which maps to the host logical volume and is used as a storing region in transmission and reception of the data between the channel adapter and the disk adapter (Kedem teaches disk adapters figure 1, item 110, Pesola, figure 5, item 550),

An interconnection device which connects to the channel adapter, the memory and the disk adapter (Kedem, figure 1, item 106 and 108, Pesola, figure 5, item 580), and

A plurality of disk drives which are connected to the disk adapter, on which disk drives the data to the internal logical volume are written by the control of the disk

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adapter as data group having a redundant relation, and (Pesola uses a data storage library with any kind of media drives and data storage interface (figure 5, item 550) which teaches plurality of media drives with the disk adapters and interconnection devices. (Figure 2A, paragraph [0031]))

The channel adapter providing at least one host logical volume for control to the upper device, the host logical volume for control being utilized when the configuration information in the memory is read from the upper device, and the channel adapter having processor which causes other internal logical volume instead of the internal logical volume to map to the host logical volume in response to a change-over indication issued from the upper device to the logical volume for control and further causing to operate spindle motors of the plurality of disk drives on which data group to the other internal logical volume and having redundant relation is written. (Pesola teaches redundant data (paragraph [0033], also teaches apparatus providing virtual volume to host machines (paragraph [0043], lines 1-5) and performs mapping change according to control information (paragraph [0039-0041], figure 3A, item 320, virtual volume (host logical volume) originally mapped to virtual volume 1 (item 340) and remapped to virtual volume 2 (figure 3B, item 350). The operation of the spindle motors would be an inherent feature of any disk drive that is accessed.

It would have been obvious to one skilled in the art at the time invention made to have used the apparatus/method of Pesola for mapping change to access the physical volume with apparatus with globally accessible memory of Kedem to store the mapping and control information and to store the data exchanged between host and disk drives

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for caching (column 2, lines 60-66) because it provides faster access to control and configuration information.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 2-3,8-10,12-13,18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pesola et al. (US 2003/0126327 A1) and Kedem (US 6,725,331 B1) as applied to claims 1 and 11 above, and further in view of Li et al. (US 2002/0144057 A1)

For claims 2 and 12, Li teaches the controller/method for selectively starting and stopping the disk spindles (see paragraph [0019-0020])

For claims 3 and 13, Li teaches that control unit determines if storage unit is on. If the storage unit is off it issues command to power on and if it is on it continue to use it (see paragraph [0035], column 2, lines 5-12)

For claims 8 and 18, Pesola teaches a volume-mapping module (figure 5, item 520, paragraph [0062])

For claims 9 and 19, Li teaches the power controller (figure 2, item 28) which selectively provides power to storage units in response to an on/off command from controller.

For claims 10 and 20, Pesola teaches storage control apparatus with adapter, which controls the mapping with respect to control information from I/O requests of hosts and also updates the control information according to the new mapping (paragraphs [0039-0041]).

It would have been obvious to one skilled in the art at the time invention made to have used the apparatus/method of Pesola and Kedem for mapping change to access physical volume with controller for shutting down or powering up the disk spindles to expand the lifetime and longevity of the disk spindles (see abstract of Li)

Allowable Subject Matter

15. Claims 6-7 and 16-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. The following is a statement of the reasons for the indication of allowable subject matter:

Pesola, Kedem and Li all fail to teach dependent claims 6 and 16. The device adapters of prior arts does not check for the command sent from upper device to the host logical volume for control is a write command, and further the processor of the channel adapter writes the content of the write command on the host logical volume and judges the content of the write command to be the change-over indication.

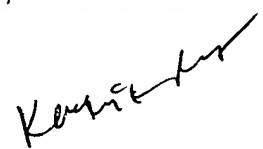
For claim 7 and 17, the device adapters fails to teach a command sent from the upper device to the host logical volume for control is a read command, the processor of the channel adapter reads the configuration information and send it to the upper device.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaushikkumar Patel whose telephone number is 571-272-5536. The examiner can normally be reached on 8.00 am - 4.30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Kaushikkumar Patel
Examiner
Art Unit 2188


9/8/05
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